REMARKS

Applicant has cancelled claim 3 and amended claims 1, 12, 19, and 20 as set forth above. Additionally, Applicant notes with appreciation, the Office's indication that claims 10 and 13 would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has objected to the phrase " the access has being independent of the data path" in claim 12. Accordingly, as set forth above, Applicant has amended claim 12 to recite "the access bus being independent of the data path." In view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw this objection.

The Office has rejected claims 19-20 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,754,800 to Lentz (Lentz) and claims 19-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,513,082 to Fischer (Fischer).

The Office states that Lentz "allocates priorities to various devices based on the number of times that they have been serviced." Additionally, the Office states Lentz describes, "[e]very time the IOU is granted use of the port, a counter is decremented. Once the counter reaches zero, the IOU is considered as hogging the bus and the priority level of the IOU is decreased.' As interpreted, the updating of the counter every time an IOU is granted use of a port anticipates the claimed 'monitoring.' Also, the decreasing the priority level for an IOU hogging the bus anticipates the claimed 'assigning a priority'." Further, the Office states Fischer describes, "a bus monitor [] to monitor usage of a system bus by a plurality of agents" and "an arbiter [] to adaptively grant usage of said system bus to said plurality of agents based on monitoring usage of system bus by respective ones of said of plurality of agents" where the system monitors the number "of individual read or write bus transactions per agent cycle slot."

Neither Lentz nor Fischer, alone or in combination, disclose or suggest, "monitoring volume of data in data transfers for a plurality of devices . . . assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 19 or "means for monitoring volume of data in data transfers for a plurality

of devices . . . means for assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 20. The claimed invention has the advantage of allowing efficiency when assumptions underlying assumptions by making the priorities in the arbitration flexibility, as stated in the Specification at page 2, lines 18-20.

The Office's attention is respectfully directed to col. 14, lines 40-48 in Lentz which discloses a dynamic arbitration scheme that allocates priority among devices depending upon the device's assigned priority, a row match between a requested address and the address of a previously serviced request, the number of times denied service, and if the master has been serviced too many times. Additionally, the Office's attention is directed to col. 15, lines 8-11, in Lenz which describes a system of counting where a device has an associated counter that counts down and when the counter reaches zero the device's assigned priority is decreased. Accordingly, Lentz discloses assigning a priority based on a device's assigned priority, a row match between a requested address and the address of a previously serviced request, the number of times denied service, if the master has been serviced too many times, and when the counter reaches zero, but provides no teaching or suggestion of assigning priority to devices according to the volume of data in the data transfers generated by each device as claimed.

As set forth at col. 2, lines 15-22, Fischer discloses an arbitration system where two arbiters control access to a bus. For example as disclosed at col, 3, lines 49-53 in Fischer, an internal arbiter and an external arbiter may both control access to a bus. As disclosed at col. 7, line 47-col. 8, line 67 in Fischer, these arbiters use statistics to determine priority, measuring the frequency of access by an agent and measuring number of individual read and write transactions by an agent. Accordingly, Fischer discloses the use of statistics based on the frequency of access to determine priority, but does not teach or suggest measuring the volume of data sent during a data transaction or assigning priority to devices according to the volume of data in the data transfers as claimed.

Accordingly, in view of the foregoing remarks, the Office is respectfully requested to reconsider and withdraw the rejections of claims 19 and 20.

The Office has rejected claims 1, 2, 12, 15-17, and 19-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,185,647 to Shibuya (Shibuya) alone, or alternatively, in view of U.S. Patent No. 6,073,199 to Cohen (Cohen). The Office asserts Shibuya describes, "an algorithm for deciding the priority by the priority decision circuit 20 includes counting over a specified period of time the number of accesses of the host computer 10 to the device circuits 22-1 and 22-4 connected to the slots 20-1 to 20-4", "[t]he priority decision circuit 26, setting a higher priority when the number of accesses is equal to or more than a predetermined threshold value and setting a lower priority when the number of times of access is less than the predetermined threshold value", and "the priorities are determined on the basis of the frequencies of access to a plurality of slots". Additionally, the Office states Shibuya discloses, "mapping is effected so that a slot having a higher access frequency is connected to the slot position having a higher priority on the bus and that a slot having a lower access frequency is connected to the slot position having a lower priority on the bus".

Neither Shibuya nor Cohen, alone or in combination, disclose or suggest, "wherein the crossbar comprises an arbitration unit to monitor data traffic generated by each of the plurality of functional units through the crossbar and assigns a priority to each functional unit based on the data traffic, wherein the arbitration unit monitors data traffic from each functional unit by monitoring the type of data that each functional unit transfers." as recited in claim 1, "monitoring volume of data in data transfers for a plurality of devices . . . assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 19 or "means for monitoring volume of data in data transfers for a plurality of devices . . . means for assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 20. The claimed invention has the advantage of allowing efficiency when assumptions underlying assumptions by making the priorities in the arbitration flexibility, as stated in the Specification at page 2, lines 18-20.

The Office's attention is respectfully directed to col. 4, line 46 - col. 5, line 16, in Shibuya which disclose that the mapping circuits described generally count the frequency of access of each device. There is no teaching or suggestion in Shibuya that the mapping circuits monitoring the type of data that each functional unit transfers or monitoring volume

of data in data transfers for a plurality of devices and assigning a priority to each device corresponding to the volume of data in data transfers. Cohen does not correct these defects of Shibuya. The Office's attention is directed to col. 4, lines 5-30 in Cohen which describes a method of arbitration using a history queue, so that the last bus master has the lowest priority. However, like Shibuya, there is no teaching or suggestion in Cohen of an arbitration unit that monitors data traffic from each functional unit by monitoring the type of data that each functional unit transfers or monitoring volume of data in data transfers for a plurality of devices and assigning a priority to each device corresponding to the volume of data in data transfers.

Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejections of claims 1, 19, and 20. Since claims 2, 12, and 15-17 depend from and contain the limitations of claim 1, they are distinguishable over the cited references and patentable in the same manner as claim 1.

The Office has rejected claims 1-2, 4-9, 11-12, 14-17, and 19-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,038,630 to Foster (Foster) in view of Fischer, claim 3 under 35 U.S.C. 103(a) as being unpatentable over Foster in view of Fischer and further in view of U.S. Patent No. 6,499,090 to Hill (Hill), and claim 18 under 35 U.S.C. 103(a) as being unpatentable over Foster in view of Fischer and further in view of U.S. Patent No. 6,226,702 to Yakashiro (Yakashiro).

The Office asserts Foster describes a system having a crossbar and arbitrator. The Office concedes that in Foster, the arbitrator 235 "can be implemented using any one of various arbitration schemes", "none of the arbitration schemes described in Foster explicitly disclose of 'monitor[ing] data traffic generated by each of the plurality of functional units through the crossbar and assign[ing] a priority to each functional unit based on the data traffic". The Office asserts, "Fischer discloses of a system that prioritizes agents based on monitored usage of the system bus by the agents." Further the Office acknowledges, "the Foster/Fischer combination does not adjust priorities based on delays in getting requests serviced", but states, "Yakashiro teaches of prioritizing requests based on their waiting time".

Foster, Fischer, Hill, and Yakashiro, alone or in combination, do not disclose or suggest, "wherein the crossbar comprises an arbitration unit to monitor data traffic generated by each of the plurality of functional units through the crossbar and assigns a priority to each functional unit based on the data traffic, wherein the arbitration unit monitors data traffic from each functional unit by monitoring the type of data that each functional unit transfers." as recited in claim 1, "monitoring volume of data in data transfers for a plurality of devices ... assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 19 or "means for monitoring volume of data in data transfers for a plurality of devices ... means for assigning a priority to each device corresponding to the volume of data in data transfers generated by the device" as recited in claim 20.

As above, in Fischer, the arbiters use statistics to determine priority, measuring the frequency of access by an agent and measuring number of individual read and write transactions by an agent, as disclosed at col. 7, line 47-col. 8, line 67. Accordingly, Fischer discloses the use of statistics based on the frequency of access to determine priority, but does not teach or suggest measuring the volume of data sent during a data transaction or assigning priority to devices according to the volume of data in the data transfers as claimed. Thus, Foster in combination with Fischer does not teach the limitations of claims 1, 19, and 20.

As the Office has acknowledged neither Foster nor Fischer, alone or in combination, disclose or suggest adjusting priorities based on delays in getting requests serviced. The Office's attention is respectfully directed to col. 4, lines 9-24, in Yakashiro which describes a system of priority depending upon waiting time of requests. However, Yakashiro does not teach or suggest measuring the volume of data sent during a data transaction or assigning priority to devices according to the volume of data in the data transfers as claimed. Thus, Yakashiro in combination with Foster and/or Fischer does not teach the limitations of claim 1, upon which claim 18 depends.

Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejections of claims 1, 19, and 20. Since claims 2, 4-9, 11-12, 14-18 depend from and contain the limitations of claim 1, they are

distinguishable over the cited references and patentable in the same manner as claim 1. Further, claim 3 has been cancelled.

In view of the foregoing, it is submitted that the present application is in condition for allowance and a notice to that effect is respectfully requested. However, if any issue remains after considering this response, the Office is invited to call the undersigned to expedite the prosecution and work out any such issue by telephone.

Respectfully submitted,



Jessica M. Egner
Registration No. 51,646

c/o Gunnar Leinberg
NIXON PEABODY LLP
Clinton Square
P.O. Box 31051
Rochester, New York. 14603
(585) 263-1000
(585) 263-1600 (Fax)
Customer No. 22204

Dated: June 1, 2007